

I. ALLOWED SUBJECT MATTER

Method claims 31 to 36, radio station claim 38, and method claims 39 to 45 have been allowed.

Dependent radio station claim 30 was only objected to but would be allowed when the features and limitations of claim 29 are included in it.

Only independent radio station claims 29 and 37 have been rejected over the cited prior art.

II. Radio Station Claim 29

Claim 29 was rejected under 35 U.S.C. 103 (a) as obvious over Ramesh (US '127) in view of Antonio, et al (US '456).

US '127 describes a wireless telecommunication system, which addresses the problem of multi-path destructive interference or multi-path fading by improvements in a diversity transmission system. This applies to CDMA systems.

US '127 describes a diversity transmission system for CDMA. As already established by the Examiner, US '127 does not disclose some of the distinguishing features of the current radio station claim 29. The claimed radio station in claim 29 is distinguished by having means for performing the pre-equalization for the signals propagated from both antennas, i.e. in both radio channels; means for widening or spreading the pre-equalized transmitted signals

by the respective codes, namely the code generator, and means for pre-equalizing the signals propagated by the at least two antennas in the at least two channels according to all actually used codes and according to the transmission properties of all actually used radio channels.

The Office Action refers to figures 5 and 6 and to column 12, lines 13 to 17, of US '456 (Antonio) regarding the pre-equalization features in claim 29. However that part of the Antonio reference discloses only that the IIR filter is used for phase pre-equalization. The phase pre-equalization of the reference is not necessarily the same as the channel pre-equalization of claim 29. The modulator 114 shown in fig. 6 is for a single CDMA channel and the IIR filter occurs in I & Q spreader 252 for that channel.

Most importantly US '456 (Antonio) does not disclose or suggest the critical distinguishing features in the last paragraph of claim 29, namely that the means for pre-equalizing pre-equalizes the signals propagated by the at least two antennas according to all actually used codes and according to the transmission properties of all actually used radio channels (i.e. all the used CDMA channels).

The Office Action admits that the Antonio reference only discloses that the IIR filter for the pre-equalization takes into account only the properties of at least one channel used for the immediately considered transmission and the actual code used for it. However that is a different from the limitations in the last paragraph of claim 29. The reference simply never states that the disclose radio apparatus includes means for pre-equalizing pre-equalizes the signals

propagated by the at least two antennas according to all actually used codes and according to the transmission properties of all actually used radio channels (i.e. all the used CDMA channels).

Furthermore according to column 12, lines 13 to 17, of Antonio the IIR filter performs phase equalization, not necessarily channel equalization, as specified in the Standard IS-95. Up to now it has been not demonstrated that such a phase equalization considers not just one or more, but all, codes used by the code generator and not only the transmission properties of one or more, but of all, used radio channels. Figures 5 and 6 do not show that feature, they do not show that the equalization is performed with all actually used channels or with all channels.

The Antonio reference does not disclose or suggest whether one code used by the code generator or the transmission properties of more than one of the transmission channels is considered during the pre-equalization. Whether more than the transmission properties of one channel are considered during the phase pre-equalization depends on the channel estimation. Antonio makes no statement regarding the channel estimation or how it is performed.

It is well established that all limitations must be taught of suggested by the prior art in order for a valid rejection under 35 U.S.C. 103 (a). See for example M.P.E.P. 2143.03 and the references cited therein, e.g. *In re Royka*, 180 USPQ 580 (CCPA 1974). In the case of the present application neither Ramesh, et al, nor Antonio discloses or suggests that the radio apparatus contains means for pre-equalizing that pre-equalizes the signals propagated by the at least two

antennas according to all actually used codes and according to the transmission properties of all actually used radio channels (i.e. all the used CDMA channels).

It is well established by many U. S. Court decisions that to reject a claimed invention under 35 U.S.C. 103 there must be some hint or suggestion in the prior art of the modifications of the disclosure in a prior art reference or references used to reject the claimed invention, which are necessary to arrive at the claimed invention. For example, the Court of Appeals for the Federal Circuit has said:

"Rather, to establish obviousness based on a combination of elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant... Even when obviousness is based on a single reference there must be a showing of a suggestion of motivation to modify the teachings of that reference." *In re Kotzab*, 55 U.S.P.Q. 2nd 1313 (Fed. Cir. 2000). See also M.P.E.P. 2141

Neither reference suggests the means for pre-equalizing that pre-equalizes the signals propagated by the at least two antennas according to all actually used codes and according to the transmission properties of all actually used radio channels (i.e. all the used CDMA channels).

For the foregoing reasons withdrawal of the rejection of claim 29 under 35 U.S.C. 103 (a) over Ramesh (US '127) in view of Antonio, et al (US '456) is respectfully requested.

III. Radio Station Claim 37

Claim 37 was rejected under 35 U.S.C. 103 (a) as obvious over Lo (US '236) in view of Rasky, et al (US '122).

US '236 (Lo) discloses a radio apparatus, in which a transmitter has a plurality of transmission antennas, which transmit the same symbol and in which the signal supplied to each transmission factor is weighted by a factor, which is related to the channel transmission coefficients for the transmission between the transmitting antenna and the receiving antennas (see abstract).

However US '236 does not disclose that the same antennas are used to transmit and receive signals, as stated in the Office Action on page 4. Lo discloses transmission from a base station to various mobile units but does not discuss the reverse transmission. In each case the corresponding feature is not disclosed in US '236.

Furthermore the Office Action asserts that US '236 discloses the transmission of reference signals. This is because the transmitted signals contain symbols, which "refer" to information and thus amount to "reference signals". This is too broad an interpretation of the term "reference signals". This term is more limited than the term "information". To impute this meaning to the term is to ignore the technical context of the references and the application, namely radio engineering. The term "reference signals" has been essentially defined in

applicants' specification and has a more limited meaning in the radio engineering arts generally than the term "information".

US courts have repeatedly cautioned against using non-scientific dictionaries (or interpretations) for defining technical words. See *Anderson v. Int'l Eng'g & Mfg., Inc.*, 160 F.3d 1345, 1348-49, 48 USPQ 2nd 1631, 1643 (Fed. Cir. 1998) ("[D]ictionary definitions of ordinary words are rarely dispositive of their meanings in a technological context. A word describing patented technology takes its definition from the context in which it was used by the inventor.") *Hoechst Celanese Corp. v. BP Chems., Ltd.*, 78 F.3d 1575, 1580, 38 USPQ 2d 1126, 1130 (Fed. Cir. 1996) ("[A] general definition is secondary to the specific meaning of a technical term as it is used and understood in a particular technical field.").

In radio transmission engineering the term "reference signals" has another meaning. Reference signals are signals that are transmitted but are already known or stored in the receiver, so that they can be compared with corresponding reference signals received from the sender. The distortions of the signal transmitted through the transmission channel can be determined from this comparison. This is described in the detailed description of the applicants' specification. However a means for producing and using reference signals according to this technical meaning is not suggested to the slightest extent in US '236.

As correctly stated on pages 4 to 5 of the Office Action US '236 does not disclose multiplication of the respective received signals of the at least two

antennas with corresponding coefficients in order to form weighted received signals. This reference also does not disclose means for addition of the weighted received signals in order to form a resulting linear combination and means for supplying the resulting linear combination to a demodulator. The second reference US '122 is cited for supplying a suggestion of these features.

However US '122 discloses a diversity receiver, which permits an improved estimate of receiver diversity weighting parameters. The receiver receives different versions of one signal with coded data, combines these different versions, and decodes the data contained in the combination. Also US '122 does not disclose the use of reference signals as claimed in the current claim 37.

Furthermore US '122 only employs receiver diversity techniques in which the receiver itself estimates the coefficients, which are not coefficients that are produced in the transmitter, or known previously. The estimation of the coefficients occurs in estimation blocks 606,608, in which weighting parameters are calculated for the individual branches and used for changing the received signal versions. The versions so changed are then combined in a diversity combiner and subsequently demodulated (column 8, lines 32 to 47). In contrast according to claim 37 during formation of the linear combination of signals received by the antenna the same coefficients are used, which were used prior to that during multiplication of the transmitted reference signals propagated from the same antennas. In contrast however in the reference US '122 the coefficients are first estimated in the receiver. Thus US '122 teaches the opposite from the radio

station claimed in claim 27 and leads one skilled in the radio engineering arts away from the claimed invention.

It is well established that a reference that teaches the opposite from the claimed invention should not be combined with another reference to reject the claimed invention under 35 U.S.C. 103 (a). For example, see MPEP 2145 X. Also the Federal Circuit Court of Appeals has said:

"That the inventor achieved the claimed invention by doing what those skilled in the art suggested should not be done is a fact strongly probative of nonobviousness." in *Kloster Speedsteel AB v. Crucible Inc.*, 230 U.S.P.Q. 81 (Fed. Cir. 1986), on rehearing, 231 U.S.P.Q. 160 (Fed. Cir. 1986).

While US '236 is only concerned with the weighting of signals to be transmitted according to diversity transmission techniques, US '122 is only concerned with weighting received signals within the scope of receiver diversity techniques. These two references may not be combined in the suggested manner because the weighting of the transmission diversity operation and the weighting of the receiver diversity operation cannot be combined as suggested.

Furthermore the references teach that the weighting of the signals in diversity transmission operation according to US '236 is completely independent from the weighting of signals in receiver diversity operation according to US '122 or at least the weightings are not coupled or connected with each other according to the references. However the third paragraph of claim 37 states that the weighting means in the transmitter uses coefficients to multiply the transmitted signals prior to transmission, which are the same as the coefficients that are

used by the weighting means in the receiver to multiply the received signals in the receiver. This latter feature is neither disclosed nor suggested in either reference because each are only concerned with receiver diversity or transmission diversity.

Thus the combination of the US '236 and US '122 does not disclose or suggest all the features of claim 37, especially the feature that the weighting means in the transmitter uses coefficients to multiply the transmitted signals prior to transmission, which are the same as the coefficients that are used by the weighting means in the receiver to multiply the received signals in the receiver.

For the foregoing reasons withdrawal of the rejection of claim 37 under 35 U.S.C. 103 (a) over Lo (US '236) in view of Rasky, et al (US '122) is respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,


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